TECHNOLOGY IN TEXAS

Balancing Tradition with **Innovation**

Technology in Texas: Balancing Tradition with Innovation

In the private sector, advances in information technology (IT) provide perpetual opportunities for change and growth, but sometimes at a high cost, and with mixed results. Public sector organizations generally look to IT to provide value as a foundational business component of providing quality services to the citizens they serve and the employees they support. Managing IT within state government necessitates balancing traditional daily operations, citizen expectations, efficiency measures, and security against budget considerations. IT leaders know the competing expectations well — lean budgets, quick deployment, access anytime and anywhere, and protected, uncompromised data. In a constantly changing technology environment, agencies must be cost-efficient, yet innovative; measured, yet responsive; operational, yet strategic and visionary.

The 2018-2022 State Strategic Plan for Information Resources Management presents updated technology trends agency leaders identified as relevant and describes how these trends will impact the direction for information resources management statewide. Each agency should carefully consider how the five strategic goals outlined in this plan align with agency objectives. Each of the plan's 15 focus areas map to actions agencies may consider in their strategic planning, based on the maturity and needs of their organization.

IT has allowed agencies to perform more efficiently, and it is no surprise that the next generation of Texans has come to expect government to meet them where they are. Traditional ways of delivering services are being disrupted by innovative and agile solutions, but proper planning, resource management, and collaboration can help IT leaders adapt to the world of 24/7 access to government services. Foundational initiatives, like security and legacy modernization, are enabling the next generation of emerging trends of cloud, data analytics and the Internet of Things. As agency business and IT leaders come together to ensure IT initiatives align with overall organization priorities, the balance of tradition and innovation in Texas is achievable.

STRATEGIC GOAL 1:
Reliable & Secure Services

STRATEGIC GOAL 2:
Mature IT Resources Management

STRATEGIC GOAL 3:
Cost-Effective & Collaborative Solutions

STRATEGIC GOAL 4:
Data Utility

STRATEGIC GOAL 5:
Mobile & Digital Services

Reliable & Secure Services

Agencies are obligated to provide secure and reliable information and services to both the citizens they serve and the workforce they support. As the need to provide citizens access to information grows, the public sector continues to be an attractive target for cybersecurity attacks. Planning, testing, and readiness assessments ensure critical government IT services continue in the event of a disaster or a disruption of normal operations. Traditional planning for security and continuity of operations remains the cornerstone of successful IT management. Agencies must be ready to meet the demands for connectivity in a constantly connected world.

SECURITY
Securing and protecting government and citizen information

Information security continues to be at the forefront in the minds of both IT practitioners and state leadership. Agencies are trusted with the most sensitive and confidential information of the citizens they serve, and are responsible for ensuring information is not compromised. For the government to run effectively, the state must protect data and ensure it is used appropriately.

Challenge
Increasing sophistication of threats, limited availability of security professionals, and the potential catastrophic impact of breaches have kept information security in the spotlight across the nation. Competition for skilled professionals and limited resources have placed a burden on the public sector's ability to address these issues. Agencies must be strategic in their approach to information security to compensate for any technological or professional shortfalls.

Actions
➡ **Assess** risks based on industry standards and prioritize cybersecurity resources to address the greatest risks.
➡ **Develop** and adhere to a software currency policy that reduces the use of unsupported software and decreases security vulnerabilities in state agency IT systems.
➡ **Leverage** the agency's information security plan and Texas Cybersecurity Strategic Plan to obtain executive sponsorship for cybersecurity initiatives and to advocate for cybersecurity issues.

Outcomes
Short-term: Adequate resources to effectively manage the agency's security program and reduced risk and vulnerability of the agency's information systems.
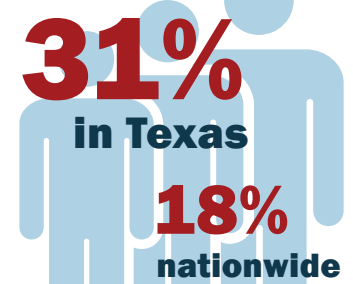**Long-term:** Continued protection of private and confidential information, minimized exposure to cyberattacks, and a mature risk-based security program.

Importance of Security

73% Strongly Agree

23% Agree

4% Neutral
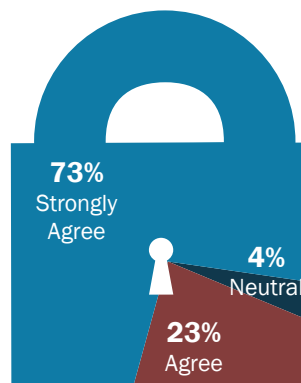
Projected employment growth for information security analysts from 2014 - 2024

31% in Texas

18% nationwide

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS   SOURCE: BUREAU OF LABOR STATISTICS

CONTINUITY OF OPERATIONS
Preparing for continued operations during and after an emergency

Texas must be prepared to restore critical government operations in the face of a disaster or the disruption of services. Business continuity planning is crucial to the recovery of technology assets and resuming mission-critical functions. The State Office of Risk Management, in coordination with the Texas Office of Homeland Security, the Texas Division of Emergency Management, and DIR, has implemented a comprehensive continuity planning program for state entities.

Challenge
State law requires agencies, except institutions of higher education, to prepare continuity of operations plans, but these plans sometimes neglect to incorporate interagency relationships regarding IT infrastructure. Although the restoration of systems and data throughout the state is mature and the rate of compliance with state standards has increased in the previous biennium, business operations in Texas remain vulnerable to disruption.

Actions
➡ **Test** and improve business continuity plans routinely to optimize effectiveness, including an annual exercise of agency continuity plans.
➡ **Consider** cloud infrastructure as a mechanism for business continuity and disaster recovery from diverse locations.
➡ **Formalize** alternate worksite policies to improve continuity of operations, ensuring organizations enable appropriate controls for telework options.

Outcomes
Short-term: The identification and prioritization of the critical personnel, facilities, and resources required to continue delivery of necessary functions after an emergency.
Long-term: A holistic approach to incident management that includes collaboration and standard command and control management structures.

CONNECTIVITY
Ability to interconnect platforms and systems

Agencies rely on voice and data networks to access information, communicate, and deliver services to other government agencies, business partners, and citizens. Network technologies provide the foundation for voice and data services to navigate within and across agencies, and to reach constituents throughout the state.

Challenge
Employees and citizens are increasingly expecting continuous connectivity to conduct work and business at higher quality, greater capacity, and faster speeds. Upgrading aging network infrastructure is often costly. Meanwhile, pressure is placed on networks due to increasing cloud adoption and demand for services as vast amounts of data are transferred over the state's IT infrastructure.

Actions
➡ **Implement** a capacity management plan to ensure network performance of critical IT services, and manage bandwidth growth and costs in alignment with agency resources and IT projects.
➡ **Upgrade** data networks to ensure that capacity can support emerging technologies for the secure transmission of data, voice, and video.
➡ **Investigate** wireless communications solutions to enable and expand broadband coverage in remote areas.
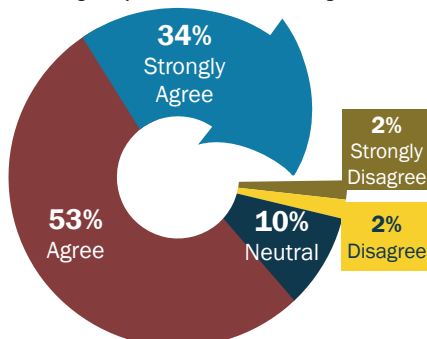
Outcomes
Short-term: A reliable network infrastructure, resulting in faster access to applications and increased employee productivity.
Long-term: Increased adoption of newer technologies, including unified communications such as integrated, real-time communication such as voice, chat, video, cloud, and mobile solutions for more efficient government services delivery.

Importance of Continuity of Operations
*Percentages may not total 100 due to rounding

- 34% Strongly Agree
- 53% Agree
- 10% Neutral
- 2% Strongly Disagree
- 2% Disagree

244 the number of Texas cities with state owned and leased facilities

Importance of Connectivity
*Percentages may not total 100 due to rounding
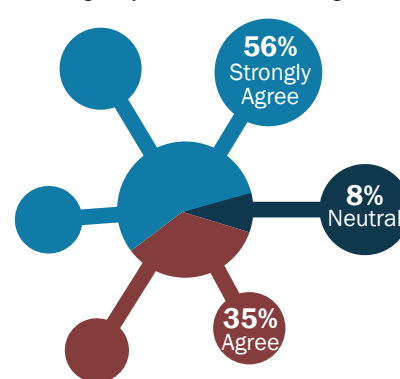
- 56% Strongly Agree
- 8% Neutral
- 35% Agree

25 **Terabytes** of traffic per day through the Network Security Operations Center (NSOC)

Mature IT Resources Management

The challenge to do more with less has become a business principle for government, making implications for cost optimization, governance, and the workforce apparent. Traditional funding models challenge agencies' ability to implement innovative strategies. Agencies must follow rules and guidelines for IT projects, as they are accountable to the public and leadership for results. Decisions must ensure IT sustains and extends the organization's strategies and objectives, and that staff have the necessary knowledge, skills, and abilities to perform IT functions effectively.

COST OPTIMIZATION
Strategies for maximizing business value and reducing costs

Cost optimization brings business and IT together to determine ways that agencies can meet service-level expectations while controlling costs. It includes an analysis of impacts for technology, including increased spending for greater long-term value. To optimize spending, agencies must evaluate costs across a variety of perspectives, such as assets, services, and business capabilities.

Challenge
Agencies often operate under traditional funding models and frameworks that can act as impediments to the best value of IT solutions. Traditional cost-cutting methods hinder cost optimization, as investments that would yield more efficient results in the long term are delayed or underfunded.

Actions
➡ **Bring** chief financial officers and IT directors together to determine the best way to fund agency technology projects, implementing mechanisms for evaluating business priorities and tracking related investments.
➡ **Leverage** shared services and statewide software licensing to achieve volume discounts while deploying modern technologies to optimize usage of existing enterprise assets.
➡ **Use** cooperative contracts and the state bulk purchasing efforts for best pricing and terms for IT purchases.

Outcomes
Short-term: Clear understanding of Return on Investment for IT spending and opportunities for savings.
Long-term: A proactive IT spending model with full utilization of IT resources and opportunities for innovation and new initiatives.

Importance of Cost Optimization
*Percentages may not total 100 due to rounding
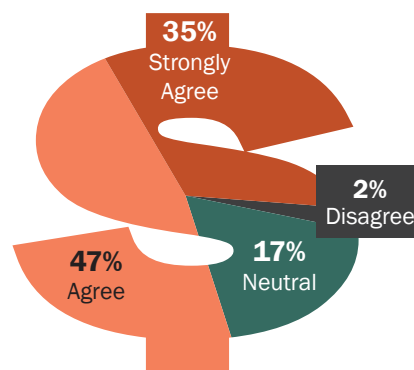
- 35% Strongly Agree
- 2% Disagree
- 17% Neutral
- 47% Agree

2.2% IT expenditure of total state spend

3.6% in other states

IT PLANNING & GOVERNANCE
Ensuring IT operations support organizational goals and priorities

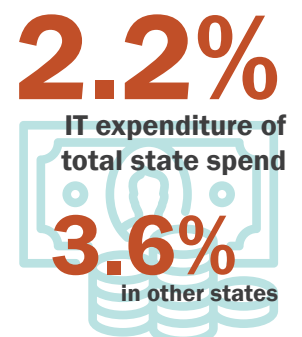Today, nearly all initiatives undertaken by an organization have one or more IT components, warranting appropriate agency governance throughout the process. Successful planning and governance includes accountability and formalized processes for making, communicating, and implementing decisions. While statewide IT project planning frameworks and guidance are available to agencies, each agency is ultimately accountable for the successful delivery of their projects.

Challenge
IT project failures are often connected to gaps in planning and decision making. These project failures can occur when agencies neglect to budget sufficient time to fully identify project requirements, or fail to include critical stakeholders throughout the life of the project.

Actions
➡ **Adopt** agile development methodologies, breaking up large projects into phases that incrementally add functionality and reduce time to deployment.
➡ **Establish** roles for agency Information Resources Managers in developing agency strategic plans to assist in aligning IT and business across the organization.
➡ **Assign** executive ownership of policy and change management decisions for IT projects.

Outcomes
Short-term: Prioritized decision making that includes the right people and perspectives.
Long-term: Reduced risk, sound project management practices, and proper governance for future IT investments.

IT WORKFORCE
Recruiting and retaining a fully trained and qualified technology workforce

As technology continues to evolve, so does the need for individuals who possess the skills to use, manage, and maintain it. In addition, more state employees are retiring, taking with them valuable knowledge and skills that can be difficult to replace. Workforce planning is necessary to ensure agency IT departments can continue to function.

Challenge
Obtaining a fully-qualified IT staff remains a challenge for agencies due to budget constraints and the complex nature of the skillsets required, and competition for limited resources creates challenges for retaining top talent. Public sector entities are often unable to offer comparable compensation and compete with the private sector for well-qualified technology professionals.
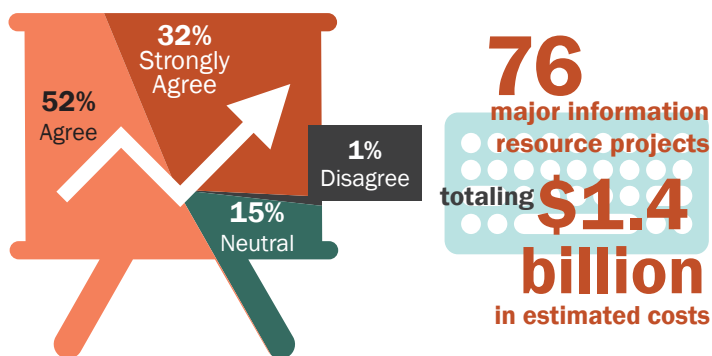
Actions
➡ **Partner** with educational institutions for potential internships or apprenticeships for technical students.
➡ **Integrate** continuous learning into the agency's employment selection and perform job analysis and disparity studies to determine appropriate salary ranges for the knowledge, skills, and abilities of the technical workforce.
➡ **Investigate** employment incentives such as flexible work schedules, telework, and employer-provided training as tools to recruit and retain qualified employees.

Outcomes
Short-term: Expanded candidate pool to fill organizational staffing needs and greater understanding of IT skillsets needed.
Long-term: A qualified, competent workforce to manage the technical complexities for increased organizational effectiveness.

Importance of IT Planning & Governance

32% Strongly Agree
52% Agree
1% Disagree
15% Neutral

76 major information resource projects totaling **$1.4 billion** in estimated costs

Importance of IT Workforce
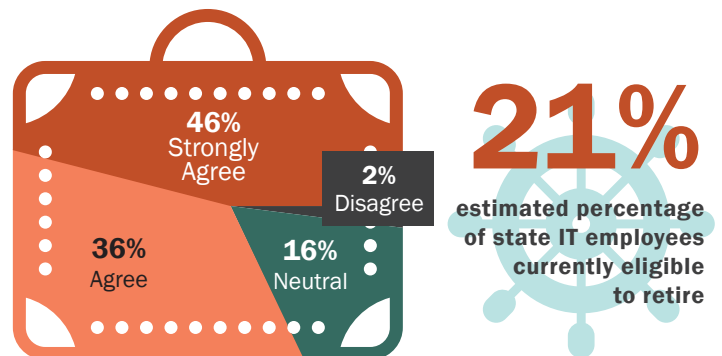
46% Strongly Agree
2% Disagree
36% Agree
16% Neutral

21% estimated percentage of state IT employees currently eligible to retire

STRATEGIC GOAL 3

Agencies are facing the next step in modernizing legacy hardware and software, replacing aging systems to move toward a more collaborative, agile, and interoperable state government. As agencies transition from traditional practices to innovative solutions, they will need to evaluate current and ongoing investments in legacy systems, and consider the scalable services of cloud and the efficiencies of shared services. Legacy modernization, cloud, and shared services will continue to increase in impact. Determining which services to use, with whom to share services, and how to get there may not be easy, but is essential to the future success of state agency IT.

LEGACY MODERNIZATION

Addressing outdated technology, computer systems, or applications

A legacy system operates with old, obsolete, insecure, or inefficient hardware or software. The world is moving towards the adoption of new technologies at a fast pace, driven by promises of agility and operational efficiency. As agencies transition from old IT infrastructure, legacy modernization remains a challenge that requires prioritization of systems that pose operational and security risks.

Challenge

Legacy systems are more difficult and costly to maintain and carry more security risks. Many core, mission-related functions rely on them but migrating functions to updated, secure systems can be costly. With a current statewide modernization effort and legislative support to update these systems, it will continue to take prioritization, planning, time, and sufficient resources before the state can resolve these issues.

Actions

➡ **Evaluate** Software-as-a-Service (SaaS) and commercial-off-the-shelf (COTS) solutions before building custom applications.
➡ **Utilize** an application portfolio management solution to accurately inventory business applications and the resources required to provide operational support of those applications over their lifetimes.
➡ **Leverage** the Texas Application Delivery Decision Framework (ADDF) and the Legacy Modernization Guide to determine appropriate course of action to take regarding legacy systems and applications.

Outcomes

Short-term: Repeatable, adaptable methodologies to standardize and prioritize legacy system modernization, and reduced risk of system and data breaches.
Long-term: A proactive approach for managing IT, shifting focus on emerging technologies, reducing future costs, improved security, and better application efficiency.

Importance of Legacy Modernization

- 2% Strongly Disagree
- 9% Disagree
- 22% Neutral
- 29% Strongly Agree
- 38% Agree
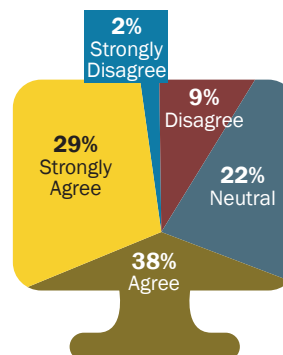
82
IT projects
evaluated in 2016 **Prioritization of Cybersecurity Legacy Systems effort**

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS   SOURCE: DIR

CLOUD SERVICES
Storing, managing, and accessing data over a public or private network

Cloud services offer alternatives to traditional IT delivery models. Cloud-computing - a model that enables on-demand network access to resources - has changed how business is done. If implementation of cloud services is done carefully and appropriately, it can ease the burden of aging infrastructure and provide flexible, lower-cost, IT service delivery.

Challenge
Concerns regarding security, legacy systems, procurement, and variations in industry practices have kept agencies from advancing cloud implementation beyond basic applications to a more holistic, streamlined, and interoperable IT infrastructure. Moving to the cloud can initially be a cost-saving move, but proper vendor management, adequate connectivity, and project planning is necessary to avoid unforeseen costs and circumstances.

Actions
➡ **Increase** use of DIR cloud contracts and statement of work templates to determine where to start and implement solutions.
➡ **Participate** in secure, cost-effective cloud products and services offered through Data Center Services Hybrid Cloud.
➡ **Develop** a comprehensive strategy that will guide cloud deployments, then pilot applications in the cloud.

Outcomes
Short-term: Cost-savings from the state's buying power, increasing data storage and data processing ability through the pay-as-you-go cloud model.
Long-term: Investments in services rather than infrastructure, allowing for cost savings and replacement of unsupported (legacy) systems.

SHARED SERVICES
Expanding an IT service within and among organizations according to similar needs

Shared services allow for agencies to focus limited resources on IT applications and supported business functions. This allows for improved operational efficiency, optimized delivery services, cost-savings, and harmonized operations.

Challenge
Getting agencies to adapt to a shared services model has proven to be a difficult task. Concerns about operational governance and the personnel to maintain the systems continue to be challenges. However, with appropriate governance and engagement agencies can maintain a high level of visibility and control over their service delivery.
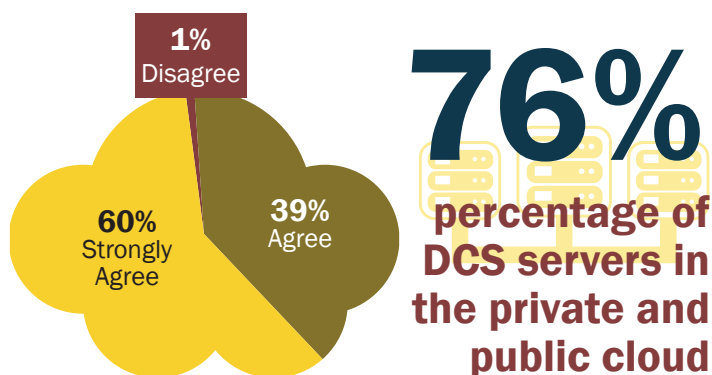
Actions
➡ **Continue** to leverage existing shared service models to create additional cost savings for the state.
➡ **Develop** shared service models based on business values to create a more consistent IT landscape.
➡ **Obtain** executive support for customer governance needed to continually develop and deploy shared services solutions.

Outcomes
Short-term: Benefit of cost savings, with a focus on improvement of customer relations.
Long-term: Better usage of IT as a service, enabling agency heads to focus on mission rather than directly managing administrative services, such as IT.
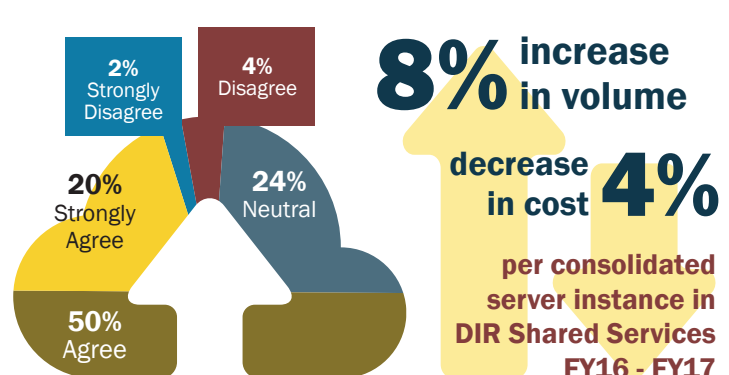
Importance of Cloud Services

1% Disagree
60% Strongly Agree
39% Agree

76% percentage of DCS servers in the private and public cloud

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS   SOURCE:DATA CENTER SERVICES PROGRAM

Importance of Shared Services

2% Strongly Disagree
4% Disagree
24% Neutral
20% Strongly Agree
50% Agree

8% increase in volume
decrease in cost **4%** per consolidated server instance in DIR Shared Services FY16 - FY17

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS   SOURCE: DIR

Data Utility

STRATEGIC GOAL 4

Data is one of our most valued strategic assets, with the ability to inform agency business processes and decisions. Implementing strategies to obtain greater benefit from data will provide cost savings and improved service delivery. While many agencies are mature in the traditional organization, administration, governance, and management of their data, there are opportunities for innovation that come from open data and data analytics.

DATA MANAGEMENT & GOVERNANCE
Strategies that put organizations in control of their business data

Data can be one of an organization's most valuable assets, or a major hindrance to fulfilling its mission. The exponential increase in data has created both challenges and opportunities for organizations. To benefit from this vast amount of data, agencies must implement fundamental data management, governance, policies, and best practices.

Challenge
As volumes of data increase, so do the challenges that agencies face when managing that data. Data may exist within departments, programs, or even people, and without clear data retention and storage practices, it can be costly. Often organizations do not have a complete picture of their existing data, making it difficult to develop and adhere to a master data management plan. Agencies will be unable to fully realize the potential of its data without implementing proper data management practices.
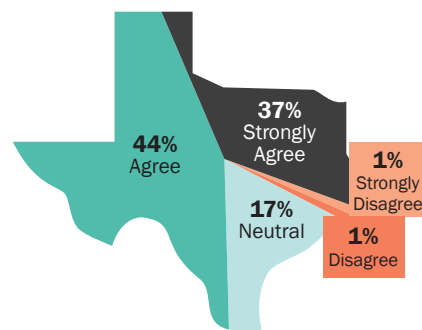
Actions:
➡ **Leverage** the Texas Data Management Framework as a resource for developing a mature data management program.
➡ **Develop** intra or interagency data governance groups to ensure the appropriate individuals are engaged in data-related decisions.
➡ **Appoint** an individual dedicated to managing and maintaining the organization's data, using the State Auditor's Office job classifications.

Outcomes
Short-term: Better understanding of the type, location, volume, and ownership of data possessed by the agency.
Long-term: Improved business decisions, reduced costs, and the ability to automate processes.

Importance of Data Management & Governance

44% Agree
37% Strongly Agree
17% Neutral
1% Strongly Disagree
1% Disagree

90% of existing data in the world generated in the last two years

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS

SOURCE: ENTREPRENEUR, 2016

OPEN DATA
Providing public access to data

Publicly-available data, or data shared between agencies, has great potential for use by individuals and organizations alike. By providing non-sensitive or confidential data to the public, agencies can reduce the amount of time and effort spent fulfilling public information requests. Additionally, reducing duplicative data efforts between agencies can increase efficiencies and reduce waste.

Challenge
Opening datasets to the public can be challenging for agencies due to concerns regarding the efficacy, integrity, and accuracy of the data. Furthermore, privacy and security issues are of utmost importance which can lead to hesitations in releasing data. Unstandardized data practices between and within agencies make data sharing and integration more complicated.

Actions
➡ **Identify** potential low-risk and frequently requested data to determine suitability for publication on the Texas Open Data Portal.
➡ **Adopt** an open-first mentality to managing datasets, which assumes the data may be publicly available at some point.

Outcomes
Short-term: Reduced frequency of open records requests and staff time spent responding to requests.
Long-term: Improved transparency, greater citizen engagement, and accountability.

DATA ANALYTICS
Using data to inform planning and decision-making

Vast amounts of structured and unstructured data have transformed the way organizations make decisions. From identifying potential areas of crime to ensuring application availability, data-driven decision making can help agencies fulfill their missions.

Challenge
While analytics can benefit an organization, the tools and strategies are rendered useless without proper data management and governance. Analytical decisions are only as good as the data they are based on. Therefore, it is crucial that an agency first develop a functional data management program and address data quality related issues before leveraging analytical capabilities.

Actions
➡ **Identify** business opportunities for analytics and align business goals with analytical strategy.
➡ **Integrate** data sources within the agency to create a more holistic view of the data.
➡ **Partner** with other agencies or organizations with analytical experience to share and pilot analytical software.
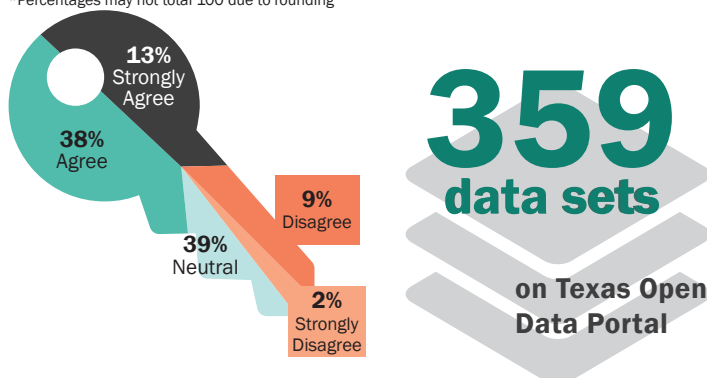
Outcomes
Short-term: Greater insight for data-driven decisions and identifying areas for cost savings and improvement.
Long-term: Efficient use of time, money, and improved service to customers through informed decisions and increased data quality throughout the enterprise.
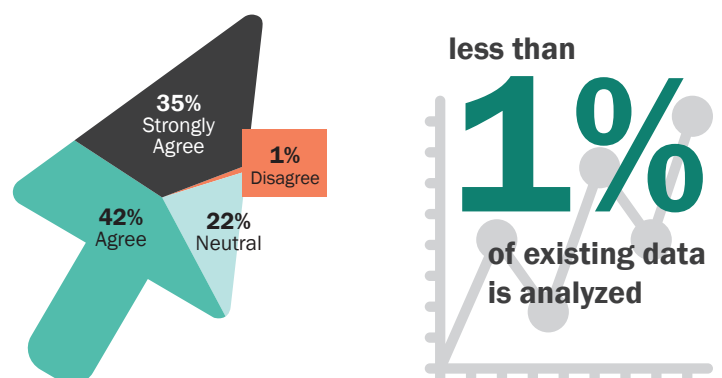
Importance of Open Data
*Percentages may not total 100 due to rounding

13% Strongly Agree
38% Agree
39% Neutral
9% Disagree
2% Strongly Disagree

359
data sets
on Texas Open Data Portal

Importance of Data Analytics

35% Strongly Agree
42% Agree
22% Neutral
1% Disagree

less than
1%
of existing data is analyzed

Mobile & Digital Services

STRATEGIC GOAL 5

As citizens, businesses, and employees demand 24/7 access to government services, agencies are challenged to implement innovative, technology-driven initiatives that allow access to citizen services anytime and anywhere. Agencies can look to mobile technology, digital services, and the incorporation of the Internet of Things to extend government services beyond traditional in-person operations.

MOBILE TECHNOLOGY
Meeting customer needs, anywhere and on any device

The continually increasing demand for mobile solutions requires government to work toward providing mobile platforms and frameworks to create a seamless and consistent user experience across many devices, services, and applications. Each agency must develop strategies to implement customer-centric services in a mobile environment, which includes mobile and user-centric applications, responsive design, and preparation for the quickly emerging role of artificial intelligence.

Challenge
Mobile devices will continue to drive government and customer interactions as citizens expect more self-service options. Agencies often lack the resources, personnel skill sets, and tools needed to deliver mobile applications with the speed and quality that are demanded in the fast-paced world of mobile technology. Mobile and user-centric applications that are not regularly maintained and updated quickly become obsolete, potentially leading to security issues.

Actions
➡ **Build** toward solutions that are accessible, device agnostic, and dynamic enough to support various types of mobile technology users.
➡ **Assess** the need for mobile applications versus responsive website design, and carefully consider which is most appropriate.
➡ **Utilize** the state web portal to create a seamless user experience for citizens through integrated web applications.

Outcomes
Short-term: Better customer and citizen interaction with government through mobile devices and applications.
Long-term: Readiness for advanced technologies and fast-moving trends brought on by the Internet of Things, machine learning and artificial intelligence.

Importance of Mobile Technologies
*Percentages may not total 100 due to rounding

- 46% Agree
- 28% Strongly Agree
- 1% Strongly Disagree
- 5% Disagree
- 19% Neutral
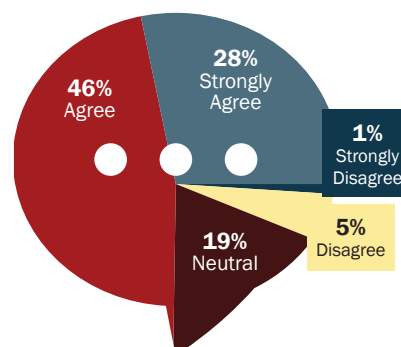
77% of American adults own a smartphone

78% own a desktop/laptop

SOURCE: DIR SURVEY OF STATE BUSINESS & IT LEADERS   SOURCE:PEW RESEARCH CENTER, 2017

DIGITAL SERVICES
Moving from paper-based processes to electronic or online formats

Digital services allow organizations to focus on effective and innovative uses of data in delivering government services. These services are driven by business needs which require careful evaluation of technological capability and resources before implementation. Digital services provide opportunities for agencies to improve and transform services by creating automated processes and workflows.

Challenge

Agencies must continue to operate systems at normal functioning levels while bringing more focus to modernizing existing technology. Obtaining executive sponsorship for a move toward digital services requires emphasis on greater flexibility, productivity, and cost savings. When IT is not included in business decisions, agencies may not get the best services to meet their needs. Securing digital services and transforming processes can be a strain on resources.

Actions

➡ **Gauge** and monitor user experience and interaction with services provided by the agency and convert agency forms into plain language formats that can be streamlined for a digital process.

➡ **Review** current business processes to identify potential automation and digitization of analog processes to create more efficient management of workflows.

➡ **Use** flexible sourcing and vendor management for faster solutions and better acquisition methods.

Outcomes

Short-term: Cost savings and faster service delivery of government services.

Long-term: A digital ecosystem with routine and more complex processes, yielding operational efficiency and improved business relationships.

INTERNET OF THINGS
Network-connected objects that can send and receive

The Internet of Things (IoT) is the collection of electronic devices connected to the Internet from which meaningful data can be extracted. IoT provides information on many variables that affect our daily lives, from health and safety, to transportation and education. More than just sensors, IoT can provide opportunities for agencies to leverage data to make services smarter, more responsive, and citizen-centric.

Challenge

Many agencies have not yet explored the possibilities of IoT and how the potential benefits may outweigh perceived risks. While concerns about security remain a top barrier to full utilization of IoT, agencies should focus on the potential for the types of data that IoT can provide.
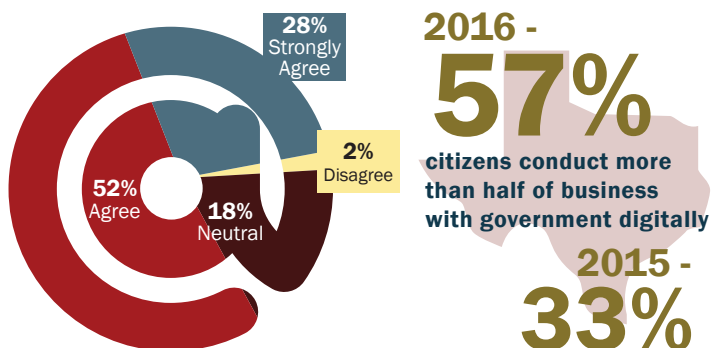
Actions

➡ **Identify** current organizational barriers and evaluate whether real-time data collection can provide innovative solutions.

➡ **Determine** ways that data will be secured through implementing policies and planning for practical IoT usage.

➡ **Define** data and provide categorization that ensures it is meaningful and therefore useful.

Outcomes

Short-term: Innovative solutions using real-time data collection to benefit customers and citizens.

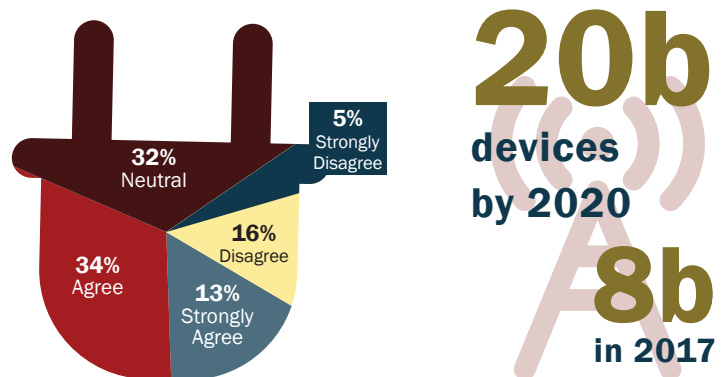**Long-term:** A connected infrastructure that can help agencies be more efficient.

Importance of Digital Services

28% Strongly Agree
52% Agree
18% Neutral
2% Disagree

2016 - **57%** citizens conduct more than half of business with government digitally

2015 - **33%**

Importance of Internet of Things

32% Neutral
5% Strongly Disagree
34% Agree
16% Disagree
13% Strongly Agree

20b devices by 2020

8b in 2017

11

Agency Spotlights

Reliable and Secure Services

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
Information Security Training

TCEQ has implemented foundational information security controls to protect assets and data from unauthorized dissemination or use, including development of security policies and standards appropriate for the agency's mission, based on Texas Cybersecurity Framework.

TCEQ scored higher than the state agency average in 35 objectives in its FY17 risk assessment. TCEQ promotes ongoing cybersecurity training and awareness with participation at 100% for new hire and 99.7% in FY17 for ongoing annual training.

Mature State IT Resources Management

TEXAS WORKFORCE COMMISSION (TWC), TEXAS EDUCATION AGENCY (TEA), & TEXAS HIGHER EDUCATION COORDINATING BOARD (THECB)
The Texas Internship Challenge

The Texas Internship Challenge is a tri-agency Initiative among TWC, TEA, and THECB that challenges industry and employer partners to offer more paid internships for Texas students.

Launched in February 2017, the Texas Internship Challenge encourages employers to offer paid or for-credit applied learning opportunities and students to participate in thousands of internships around the state. Internships help students gain the marketable skills employers are looking for and introduce students to in-demand occupations.

At *txinternshipchallenge. com*, employers can register and post internship positions and students can search for internships and enter their resume.

Cost-Effective and Collaborative Solutions

TEXAS HIGHER EDUCATION COORDINATING BOARD (THECB)
Modernization of the State Higher Education Accountability System

THECB successfully modernized the state Higher Education Accountability System, which was first developed in 2004 by executive order from then-Governor Perry. The Accountability system is used to track performance on critical measures that exemplify higher education institutions' missions and is modeled on the state's new 15-year higher education plan, 60x30TX.

With increased functionality and improved usability, the new system provides institutions, students, parents and the public with easy access to accountability measures, data and reports. It has been well received and appreciated by state wide users since the initial go-live.

The new design and data architecture help the agency save over 600 hours yearly of IT resources spent on support and maintenance.

Data Utility

TEXAS PARKS AND WILDLIFE DEPARTMENT (TPWD)
Boater Registration

TPWD continues to leverage the Texas Open Data Portal (data.texas.gov) to publish boater registration data. The availability of this information on a publicly accessible website has allowed TPWD to reduce the number of Public Information Requests (PIRs) that would otherwise be addressed by traditional processes.

Because of having this data readily available to the public, TPWD has seen a reduction, on average, of 65 individual requests per month to 5 or less per month resulting in greater efficiency for the agency and a faster turnaround, improved customer service experience for the information requestor.

TEXAS NATIONAL RESOURCES INFORMATION SYSTEM (TNRIS), TEXAS WATER DEVELOPMENT BOARD (TWDB)
Hurricane Harvey Emergency Management Operations for Greater Houston Area

Before and during Hurricane Harvey, which hit the coastal Texas cities in August 2017, TNRIS and TWDB worked together to map and produce data to track the landfall of the hurricane and the areas that were affected. In the State Operations Center (SoC), these agencies used flood polygons as barriers for routing vehicles, and routing maps for evacuation busses, times and routes for responses back in the affected areas.

Also in the SoC, they analyzed data regarding schools and school districts in the flooded area, updated layers and data services, including tracking of uncertainty for

future Hurricanes Irma and Jose. The agencies could prepare miscellaneous custom maps, table reports, and figures that aided Hurricane Harvey's response and recovery efforts.

Mobile and Digital Services

HARRIS COUNTY METROPOLITAN TRANSIT AUTHORITY (METRO)
Social Media Customer Care

METRO combined an open source software module with a user interface built in-house to enable their social media specialists to post and manage real-time service alerts for patrons.

The new interface allows them to post the exact same alert to Facebook, Twitter, the RideMetro. org website, Google and the METRO trip-planning mobile app simultaneously. The social media specialists can also now respond to 90 percent of submitted queries within 15 minutes.

TEXAS VETERANS COMMISSION (TVC)
Texas Veteran's Portal

In 2016, TVC launched a redesign of the Texas Veteran's Portal, www. veterans.portal.texas. gov, which made the site

mobile accessible and user-friendly and includes features important to the state's 1.6 million veterans. The effort was a collaboration of a multi-agency advisory committee and the University of North Texas team, and participation by veterans during testing efforts.

The portal connects veterans, their families, caregivers, and survivors to the benefits they have earned through their military service and the resources they need to transition back into civilian life.

TEXAS STATE UNIVERSITY
Americans with Disability Act (ADA) Website Rodeo

To upgrade the quality and compliance of its websites, Texas State University has launched a program to discover and correct compliance errors. Conducting a Website Rodeo in spring 2017, they focused on training for common errors, corrections to implement within the content management system (CMS) and follow on improvement.

Web developers representing the university's 40 riskiest websites – sites with the greatest potential for creating barriers to disabled student success – received training and direct support from the CMS

team throughout the day. Prizes were awarded for the greatest improvement. Over 779 discrepancies, errors and alerts based upon WAVE, were corrected. Support staff also corrected compliance discrepancies caused by the CMS template.

An ancillary benefit was that developers carried their new knowledge to other sites they managed and the template was corrected university wide. This was such a success that a second Website Rodeo is planned for Fall 2017.

DIR Program Support

Agencies partner with the Texas Department of Information Resources for support and assistance in meeting the goals outlined in this state strategic plan. In many ways, DIR is the shared services IT organization for Texas government with both voluntary and statutorily required customers. This section highlights just a few of the enterprise services DIR provides that are critical to the efficiency of state government. They are directly available through DIR or available for purchase from one of the pre-negotiated IT commodities and services contracts.

For more information, search for these topics on www.dir.texas.gov or call 1-855-ASK-DIR1.

Bulk Purchase
DESKTOPS, LAPTOPS, TABLETS, SOFTWARE, OTHER IT EQUIPMENT

DIR coordinates computer bulk purchases to leverage statewide purchasing power.

Cloud Services
INFRASTRUCTURE, PLATFORM, SOFTWARE, BROKER, AND ASSESSMENT SERVICES

For agencies considering cloud services, DIR offers introductory resources to help guide decision makers in evaluating available options and moving forward with an implementation strategy. Once state agencies have developed a cloud strategy and are ready to move forward, DIR has several offerings available.

These services include infrastructure, platform, software, broker, assessment, and miscellaneous cloud services. Cloud services are available to state agencies through DIR Cooperative Contracts and Shared Services.

Data Center Services (DCS)
INFRASTRUCTURE MANAGED SERVICES, PUBLIC AND PRIVATE HYBRID CLOUDS, MAINFRAME, BULK PRINT/MAIL, APPLICATION DEVELOPMENT AND MAINTENANCE, AND GEOGRAPHIC INFORMATION SYSTEMS (GIS) SERVICES

DIR manages the IT infrastructure for many state agency customers through the statewide DCS program. DCS customers will soon see expanded service offerings, including a managed security services initiative.

The DCS program continues to evolve to meet customers' growing technology needs, and now offers secure connectivity to multiple public and government clouds. The two state data centers offer storage, disaster recovery, and redundancy in fully managed, 24x7x365 facilities that include redundant power, networking, business continuity, and enhanced physical security.

Data Coordination
TEXAS STATEWIDE DATA COORDINATOR, TEXAS OPEN DATA PORTAL, TEXAS DATA MANAGEMENT FRAMEWORK

The Texas Open Data Portal, data.texas.gov, hosted on the state's official website, Texas.gov, promotes government transparency, citizen participation, and the efficient use of public resources.

The website makes government data centrally available for everyone to use, interact with, and share with others The portal has over 320 publicly assessible datasets and has received over 95,000 views since the program initiated in 2014.

The Texas Data Management Framework (TDMF) is based on the core principles of the Data Management Association (DAMA) Data Management Body of Knowledge (DMBOK).

The DAMA-DMBOK core principles have been modified for Texas State government and represent the best practices associated with building and maintaining an agency's

Enterprise Information Management program.

Enterprise Solution Services (ESS)

APPLICATION PORTFOLIO MANAGEMENT, APPLICATION DELIVERY DECISION FRAMEWORK, LEGACY MODERNIZATION GUIDE

ESS provides agencies with strategic information technology guidance built on enterprise architecture, standards, collaborative communities, and technology initiatives. ESS provides technology assessments to agencies at no cost.

IT Commodities and Services

HARDWARE, SOFTWARE, SEAT MANAGEMENT, AND STAFFING SERVICES

Through the Cooperative Contracts program, DIR provides state agencies access to a wide range of products, services, and vendors. DIR negotiates pricing for IT services and commodity items such as hardware, software, personal computers, and printers.

Technology services include seat management, staffing augmentation, training, maintenance, and subscription services. DIR contracts are used as a benchmark across the

country for their aggressive discounts and exceptional service levels.

Over 700 IT commodity contracts are in place for products and services, providing a competitive and robust marketplace for customers.

IT Education and Guidance

PROJECT MANAGEMENT, IT ACCESSIBILITY, IRM CONTINUING EDUCATION, POLICY, AND RULES

It can be difficult to navigate the state laws and rules covering technology. DIR provides education, guidance, training, and technical assistance to help agencies stay in compliance when implementing technology initiatives.

Network Commodities and Services

VOIP, INTERNET, DATA PLANS, WIRELESS DEVICES

Texas agencies have access to a portfolio of data, voice, and video services through DIR enterprise contracts. Voice over IP telephone services, data circuits, Internet, and mobility solutions are also available through DIR.

The DIR-managed Texas Agency Network program provides network connectivity for the state's private network. DIR's shared Internet bandwidth

is 16-gigabit (two 8-gigabit) diverse connections. DIR has a 100-gigabit private network in place which allows for sufficient bandwidth as agencies' bandwidth needs increase.

Also, to ensure customer agency data is secure, the DIR Network Security Operations Center provides multilayer security protection for Internet traffic, securing, processing, monitoring, and analyzing 25 terabytes of traffic per day.

Online Payment Services

LICENSES AND REGISTRATIONS, PERMITS, AND RECORDS

Texas.gov provides payment processing for state agencies and eligible local governmental organizations to conduct online business with constituents. The Texas.gov payment solution is a secure, Payment Card Industry-compliant product that allows Texas.gov customers to process online and over-the-counter payments for services such as licenses and registrations, property taxes and records, permits, and vital records.

Productivity Tools

EMAIL, MICROSOFT OFFICE SUITE, SHAREPOINT, DOCUSIGN

Available to all customers, this secure and reliable suite of services is offered

through an enterprise contract in which customers can purchase licenses at a substantial discount.

Security Services

ASSESSMENTS, PENETRATION TESTING, CYBERSECURITY FRAMEWORK, SPECTRIM PORTAL, MANAGED SECURITY SERVICES

DIR offers a wealth of security products, services, information, and training to equip agencies in protecting state agency networks and private citizen information; DIR has negotiated favorable contracts for security services and tools meeting the new standardized statewide Cybersecurity Framework standards.

The Office of the Chief Information Security Officer provides guidance and leadership to improve agency security posture. It also uses incident reporting to allow up-to-the-minute, on-site cyber threats to help agencies guard against potential network breaches.

Agencies can manage governance, risk, and compliance on the SPECTRIM portal, and use the Cybersecurity Framework to document security status. Managed Security Services include security monitoring and device management, incident response services, risk and compliance services, and threat analysis.

Acknowledgments

DIR APPRECIATES THE VALUABLE INPUT PROVIDED BY AGENCY INFORMATION RESOURCES MANAGERS, PRACTITIONERS, AND EXECUTIVES IN THE DEVELOPMENT OF THIS PLAN. DIR ALSO THANKS ITS PROGRAM STAFF FOR THEIR SUPPORT AND EXPERTISE.

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